

N60201.AR.000614  
NS MAYPORT  
5090.3a

LETTER REPORT REGARDING QUARTER 2 GROUNDWATER MONITORING REPORT FOR  
SOLID WASTE MANAGEMENT UNIT 14 NS MAYPORT FL  
7/11/2002  
TETRA TECH NUS



**TETRA TECH NUS, INC.**

7018 A.C. Skinner Parkway ■ Suite 250 ■ Jacksonville, FL 32256

(904) 281-0400 ■ FAX (904) 281-0070 ■ [www.tetrattech.com](http://www.tetrattech.com)

Document Tracking Number 02JAX0179

July 11, 2002

Project Number N0424

Commander, Southern Division  
Naval Facilities Engineering Command  
ATTN: Ms. Adrienne Wilson (Code ES31)  
2155 Eagle Drive  
North Charleston, South Carolina 29406

Reference: CLEAN Contract Number N62467-94-D-0888  
Contract Task Order Number 0199

Subject: Quarter Two Groundwater Monitoring Report  
SWMU 14, Naval Station (NAVSTA) Mayport  
Mayport, Florida

Dear Ms. Wilson:

Tetra Tech NUS, Inc. (TtNUS) is pleased to submit this Quarter Two Groundwater Monitoring Report for the referenced Contract Task Order (CTO). This report was prepared for the U.S. Navy Southern Division, Naval Facilities Engineering Command under CTO 0199, for the Comprehensive Long-term Environmental Action Navy (CLEAN) Contract Number N62467-94-D-0888. The contents of this report document the fieldwork and results of the quarter two groundwater sampling effort at Solid Waste Management Unit (SWMU) 14.

SWMU 14, the Mercury/Oil Waste Spill Area, is located at the current firefighter-training center (FTC) due south of the St. Johns River, approximately 1,000 feet west of the Atlantic Ocean in the northeastern part of the NAVSTA Mayport. A site location map is presented as Figure 1.

Waste fuels and oils collected from various sources at NAVSTA Mayport were previously used to ignite and sustain fires for training purposes. These sources are no longer in use at SWMU 14. In addition, there was a petroleum storage area and an area reported to have been used for the storage of mercuric nitrate at SWMU 14 (TtNUS, 2001).

A Corrective Measures Study (CMS) (currently in draft) (TtNUS, 2001) was conducted following the RCRA Facility Investigation (RFI) Report (ABB-ES, 1995). The CMS identified naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, iron, and manganese as chemicals of concern (COCs) in the groundwater at SWMU 14 and recommended a combination of land-use controls (LUCs), passive skimming, and monitoring for natural attenuation.

An initial groundwater sampling effort was performed in July 2001 to assess the current levels of contamination at SWMU 14. The monitoring wells selected for quarterly monitoring were chosen, in part, based on the results of the initial sampling effort.

The quarter two sampling effort occurred in March 2002 and was performed in accordance with the SWMU 14 Workplan (TtNUS, 2001), the TtNUS Comprehensive Quality Assurance Plan (TtNUS, 1999), and the United States Environmental Protection Agency's (USEPA) Environmental Standard Operating Procedures Quality Assurance Manual (1996). The monitoring wells selected for sampling included

Ms. Adrienne Wilson  
SOUTHNAVFACENGCOM  
July 11, 2002 – Page 2

MPT-14-MW01S, 02S, 05S, 10S, 11S, 15S, 17S, 18S, 20S, 21S. Monitoring well MPT-14-MW15S could not be located and was not sampled during this sampling effort. The monitoring well locations are presented in Figure 2.

Prior to sampling, a complete round of water levels were collected using a slope indicator equipped with an oil/water interface probe to determine the presence of light non-aqueous phase liquids (LNAPL). LNAPL was not detected in any of the monitoring wells at SWMU 14 during the quarter two sampling effort.

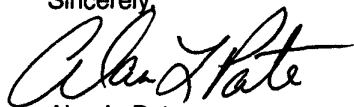
Groundwater samples were analyzed for both chemical and natural attenuation parameters during the quarter two sampling effort. Parameters selected for fixed-based laboratory analyses included polynuclear aromatic hydrocarbons (PAHs), total recoverable petroleum hydrocarbons (TRPHs), alkalinity, nitrate, nitrite, iron, manganese, and methane. Parameters selected for field analyses included carbon dioxide, dissolved oxygen, ferrous iron, hydrogen sulfide, and sulfide. Table 1 presents the field sampling results. Table 2 presents the analytical results for the selected parameters.

Two surface water samples were collected from the outfalls north of SWMU 14. The samples were analyzed for TRPHs using the Florida Petroleum Range Organics (FL-PRO) Method and PAHs using USEPA Method 8310. Table 3 presents a summary of the analytical results for the surface water samples.

Results of the second quarter sampling event indicate that 2-methylnaphthalene exceeded its natural attenuation default source concentration in well MW-18S, however, results also indicate that natural attenuation is taking place at SWMU 14. TtNUS recommends that groundwater monitoring for natural attenuation parameters continue in support of the CMS, and third quarter monitoring data for well MW-18S, be reviewed to determine if concentrations are showing an increasing or decreasing trend. If concentrations should indicate an increase in the third quarter, TtNUS will recommend corrective action be taken at the site. An aggressive fluid vapor recovery event is planned to take place at this well in late July 2002. The results of this activity will be included in the third quarter report.

Quarter three sampling was conducted in June 2002. If you have any questions with regard to this submittal, please contact me at (904) 281-0400 or Terry Hansen at (850) 385-9899.

Sincerely,



Alan L. Pate  
Project Scientist

c: Mr. J. Cason, FDEP (2 copies)  
Ms. C. Mitchell, NAVSTA Mayport  
Ms. J. Beason, NAS Jacksonville  
Mr. M. Hall, JA Jones  
Ms. D. Wroblewski (letter only)  
Mr. M. Perry/File (unbound copy)  
Mr. T. Hansen  
Project File

## TABLES

**Table 1**  
**Quarter Three Groundwater Field Sampling Results Summary**

Solid Waste Management Unit 14  
Naval Station Mayport  
Mayport, Florida

Sample ID	MPT-14-MW01S-02	MPT-14-MW02S-02	MPT-14-MW05S-02	MPT-14-MW010S-02	MPT-14-MW011S-02
Collect Date	27-Mar-2002	27-Mar-2002	26-Mar-2002	26-Mar-2002	25-Mar-2002
Total Depth (Ft. Top of Casing)	16.32	16.01	12.50	12.50	12.72
Water Level (Ft. Top of Casing)	5.4	6.52	5.35	3.02	3.80
Temperature (°C)	19.50	20.51	22.21	22.00	22.6
pH (Standard Units)	7.72	7.42	7.85	7.96	7.7
Conductivity (mS/cm)	1.57	0.71	1.15	0.461	0.748
Turbidity (NTU)	0	0	0	0	100
Redox Potential (Millivolts)	-206	-176	-178	-186	-272
Dissolved Oxygen (mg/L)	3.0	2.0	2.0	4.0	1.0
Carbon Dioxide (mg/L)	10	15	100	10	14
Sulfide (mg/L)	0.01	0.12	0.03	0.03	0.56
Ferrous Iron (mg/L)	0.16	0.56	0.04	0.1	0.83
Hydrogen Sulfide (mg/L)	0.01	5.0+	0	0.1	0.0

Notes:

Ft = Feet

°C = Degrees Celsius

mS/cm = Microsiemens per Centimeter

NTU = Nephelometric Turbidity Unit

Redox = Oxidation - Reduction

mg/L = Milligrams per Liter

µg/L = Micrograms per Liter

> 80 = Greater Than Field Instrument Detection Limits

Fe=Iron

Mn=Manganese

NA = Not Analyzed

**Table 1 (Continued)**  
**Quarter Three Groundwater Field Sampling Results Summary**

Solid Waste Management Unit 14  
Naval Station Mayport  
Mayport, Florida

Sample ID	MPT-14-MW017S-02	MPT-14-MW018S-02	MPT-14-MW20S-02	MPT-14-MW21S-02
Collect Date	26-Mar-2002	26-Mar-2002	25-Mar-2002	26-Mar-2002
Total Depth (Ft. Top of Casing)	7.25	7.29	6.00	7.50
Water Level (Ft. Top of Casing)	6.30	6.41	3.70	3.97
Temperature (°C)	22.80	23.70	22.80	22.90
pH (Standard Units)	7.1	7.03	7.07	7.13
Conductivity (mS/cm)	0.402	0.79	0.649	0.47
Turbidity (NTU)	0	0	0	0
Redox Potential (Millivolts)	-158	-153	-141	-152
Dissolved Oxygen (mg/L)	1.0	1	1.0	1.0
Carbon Dioxide (mg/L)	25	200	70	25
Sulfide (mg/L)	5	8	0.08	0.05
Ferrous Iron (mg/L)	0.88	0.37	4.2	2.64
Hydrogen Sulfide (mg/L)	5.0+	0.3	0.3	3.0

Notes:

Ft = Feet

°C = Degrees Celsius

mS/cm = Microsiemens per Centimeter

NTU = Nephelometric Turbidity Unit

Redox = Oxidation - Reduction

mg/L = Milligrams per Liter

NA = Not Analyzed

NM=Not measured

**Table 2**  
**Summary of Organic Compounds Detected in Groundwater Samples**

Solid Waste Management Unit 14  
Naval Station Mayport  
Mayport, Florida

Sample Number		MPT-14-MW01-02	MPT-14-MW02-02	MPT-14-MW05S-02	MPT-14-MW10S-02
Date		3/27/2002	3/27/2002	3/26/2002	3/26/2002
<b>Parameter</b>	<b>GCTL</b>				
<b><u>USEPA Method 8310 (µg/L)</u></b>					
1-Methylnaphthalene	20	2 U	2 U	2 U	2 U
2-Methylnaphthalene	20	2 U	2 U	2 U	2 U
Acenaphthene	20	1 U	1 U	1 U	1 U
Acenaphthylene	210	1 U	1 U	0.57 J	1 U
Anthracene	2100	2 U	0.062 J	2 U	2 U
Benzo(a)anthracene	0.2	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(a)pyrene	0.2	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(b)fluoranthene	0.2	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(g,h,i)perylene	210	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(k)fluoranthene	0.5	0.1 U	0.1 U	0.1 U	0.1 U
Chrysene	4.8	0.1 U	0.1 U	0.1 U	0.1 U
Dibenzo(a,h)anthracene	0.2	0.1 U	0.1 U	0.1 U	0.1 U
Fluoranthene	280	0.1 U	0.1 U	0.1 U	0.1 U
Fluorene	280	1 U	1 U	1 U	1 U
Indeno(1,2,3-CD)pyrene	0.2	0.1 U	0.1 U	0.1 U	0.1 U
Naphthalene	20	2 U	2 U	2 U	2 U
Phenanthrene	210	1 U	1 U	1 U	1 U
Pyrene	210	0.14 J	0.1 U	0.22 J	0.1 U
<b><u>FL-PRO Method (mg/L)</u></b>					
TRPH	5	0.3 U	0.98 U	0.3 U	0.3 U
<b><u>RSK SOP 147, 175 (µg/L)</u></b>					
Methane	NA	53	1800	61	21
<b><u>USEPA Method 300.0 (mg/L)</u></b>					
Chloride	250000	22	33	250	37
Nitrate	10000	0.02 U	0.02 U	0.02 U	0.02 U
Nitrite	1000	0.03 U	0.02 U	0.02 U	0.02 U
Sulfate	250000	46	13	70	23
Total Phosphorus	NA	0.3	0.2	0.3	0.2
<b><u>USEPA Method 310.1 (mg/L)</u></b>					
Alkalinity	NA	220	250	190	140
<b><u>USEPA Method 6010B</u></b>					
Iron	300	223	632	227	102
Manganese	50	35.1	49.4	13	71.6

See notes at end of table.

**Table 2 (Continued)**  
**Summary of Organic Compounds Detected in Groundwater Samples**

Solid Waste Management Unit 14  
Naval Station Mayport  
Mayport, Florida

Sample Number		MPT-14-MW11S-02	MPT-14-MW17S-02	MPT-14-MW18S-02	*MPT-14-MW18S-02
Date		3/25/2002	3/26/2002	3/26/2002	3/26/2002
<b>Parameter</b>	<b>GCTL</b>				
<b><u>USEPA Method 8310 (µg/L)</u></b>					
1-Methylnaphthalene	20	2 U	40 U	27 J	31 J
2-Methylnaphthalene	20	2 U	40 U	390 J	400 J
Acenaphthene	20	1 U	20 U	20 U	20 U
Acenaphthylene	210	0.13 J	20 U	20 U	19 J
Anthracene	2100	2 U	1.7 J	40 U	0.91 J
Benzo(a)anthracene	0.2	0.1 U	24 J	2 U	2 U
Benzo(a)pyrene	0.2	0.1 U	2 U	2 U	2 U
Benzo(b)fluoranthene	0.2	0.1 U	2 U	2 U	2 U
Benzo(g,h,i)perylene	210	0.1 U	2 U	2 U	2 U
Benzo(k)fluoranthene	0.5	0.1 U	2 U	2 U	2 U
Chrysene	4.8	0.1 U	2 U	2 U	2 U
Dibenzo(a,h)anthracene	0.2	0.1 U	2 U	2 U	2 U
Fluoranthene	280	0.1 U	21	2 U	2 U
Fluorene	280	1.3 J	1.4 J	7.3 J	7.1 J
Indeno(1,2,3-CD)pyrene	0.2	0.1 U	2 U	2 U	2 U
Naphthalene	20	0.34 J	40 J	5.9 J	40 U
Phenanthrene	210	0.021 J	2.6 J	3.8 J	3.6 J
Pyrene	210	0.1 U	63 J	2.6 J	2.3 J
<b><u>FL-PRO Method (mg/L)</u></b>					
TRPH	5	0.14 U	2.3	6.2 J	2.2 J
<b><u>RSK SOP 147, 175 (µg/L)</u></b>					
Methane	NA	260	330	2000	2100
<b><u>USEPA Method 300.0 (mg/L)</u></b>					
Chloride	250000	90	13	29	29
Nitrate	10000	0.02 U	0.02 U	0.02 U	0.02 U
Nitrite	1000	0.02 U	0.02 U	0.02 U	0.02 U
Sulfate	250000	31	0.3 U	5	0.3 U
Total Phosphorus	NA	0.2	0.07	0.8	0.9
<b><u>USEPA Method 310.1 (mg/L)</u></b>					
Alkalinity	NA	180	230	430	450
<b><u>USEPA Method 6010B</u></b>					
Iron	300	1000	920	414	430
Manganese	50	86.8	25.2	67.3	69.8

See notes at end of table.



**Table 2 (Continued)**  
**Summary of Organic Compounds Detected in Groundwater Samples**

Solid Waste Management Unit 14  
Naval Station Mayport  
Mayport, Florida

Sample Number		MPT-14-DPW21S-02	MPT-14-MW20S-02
Date		3/26/2002	3/25/2002
<b>Parameter</b>	<b>GCTL</b>		
<b><u>USEPA Method 8310 (µg/L)</u></b>			
1-Methylnaphthalene	20	2 U	27
2-Methylnaphthalene	20	2 U	<b>190 J</b>
Acenaphthene	20	1 U	10 U
Acenaphthylene	210	2.5	12
Anthracene	2100	2 U	20 U
Benzo(a)anthracene	0.2	0.1 U	1 U
Benzo(a)pyrene	0.2	0.1 U	1 U
Benzo(b)fluoranthene	0.2	0.1 U	1 U
Benzo(g,h,i)perylene	210	0.1 U	1 U
Benzo(k)fluoranthene	0.5	0.1 U	1 U
Chrysene	4.8	0.1 U	1 U
Dibenzo(a,h)anthracene	0.2	0.1 U	1 U
Fluoranthene	280	0.1 U	1 U
Fluorene	280	0.62 J	7 J
Indeno(1,2,3-CD)pyrene	0.2	0.1 U	1 U
Naphthalene	20	2 U	<b>71 J</b>
Phenanthrene	210	1 U	0.86 J
Pyrene	210	0.29 J	1 U
<b><u>FL-PRO Method (mg/L)</u></b>			
TRPH	5	0.45 U	6.6
<b><u>RSK SOP 147, 175 (µg/L)</u></b>			
Methane	NA	460	610
<b><u>USEPA Method 300.0 (mg/L)</u></b>			
Chloride	250000	25	30
Nitrate	10000	0.02 U	0.02 U
Nitrite	1000	0.02 U	0.03 U
Sulfate	250000	35	0.3 U
Total Phosphorus	NA	0.2	0.2
<b><u>USEPA Method 310.1 (mg/L)</u></b>			
Alkalinity	NA	200	340
<b><u>USEPA Method 6010B (µg/L)</u></b>			
Iron	300	<b>2720</b>	<b>3260</b>
Manganese	50	<b>96.3</b>	<b>148</b>

Notes: **Bold** depicts constituent exceeding GCTL

GCTL = Groundwater Target Cleanup Level from Chapter 62-777, Florida Administrative Code.

mg/L = Milligrams per liter.

µg/L = Micrograms per liter.

U = Compound below laboratory detection limits.

J = Indicates the presence of a chemical at an estimated concentration.

FL-PRO = Florida Petroleum Range Organics.

\* = Duplicate sample.

**Table 3**  
**Summary of Compounds Detected in Surface Water Samples**

Solid Waste Management Unit 14  
Naval Station Mayport  
Mayport, Florida

Sample Number		MPT-14-SW01-02	MPT-14-SW02-02
Date		3/27/2002	3/27/2002
Parameter	SWCTL		
<b><u>USEPA Method 8310 (µg/L)</u></b>			
1-Methylnaphthalene	95	2 U	2 U
2-Methylnaphthalene	30	2 U	2 U
Acenaphthene	3	1 U	1 U
Acenaphthylene	0.031	1 U	1 U
Anthracene	0.3	2 U	2 U
Benzo(a)anthracene	0.031	0.1 U	0.1 U
Benzo(a)pyrene	0.031	0.11	0.1 U
Benzo(b)fluoranthene	0.031	0.2	0.1 U
Benzo(g,h,i)perylene	0.031	0.1 U	0.1 U
Benzo(k)fluoranthene	0.031	<b>0.064 J</b>	0.1 U
Chrysene	0.031	0.16	0.1 U
Dibenzo(a,h)anthracene	0.031	0.12	0.1 U
Fluoranthene	0.3	0.1 U	0.1 U
Fluorene	30	1 U	1 U
Indeno(1,2,3-CD)pyrene	0.031	<b>0.15</b>	0.1 U
Naphthalene	26	2 U	0.12 J
Phenanthrene	0.031	<b>0.037 J</b>	1 U
Pyrene	0.3	0.17	0.1 U
<b><u>FL-PRO Method (mg/L)</u></b>			
TRPH	5000	0.45 U	0.3 U

Notes:

**Bold** depicts constituents exceeding SWCTLs.

GW = Groundwater Target Cleanup Level from Chapter 62-777, Florida Administrative Code.

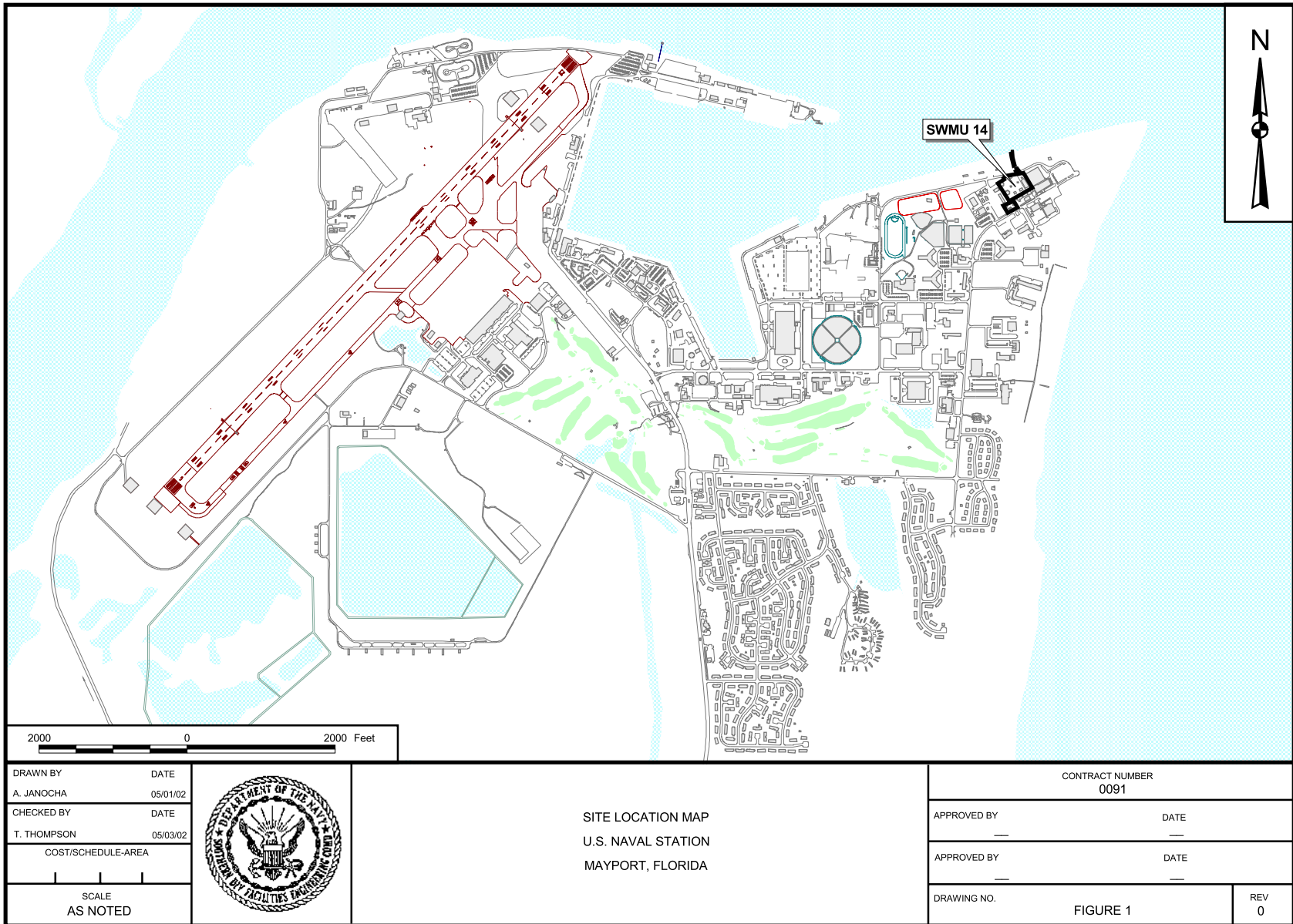
µg/L = Micrograms per liter.

FL-PRO = Florida Petroleum Range Organics.

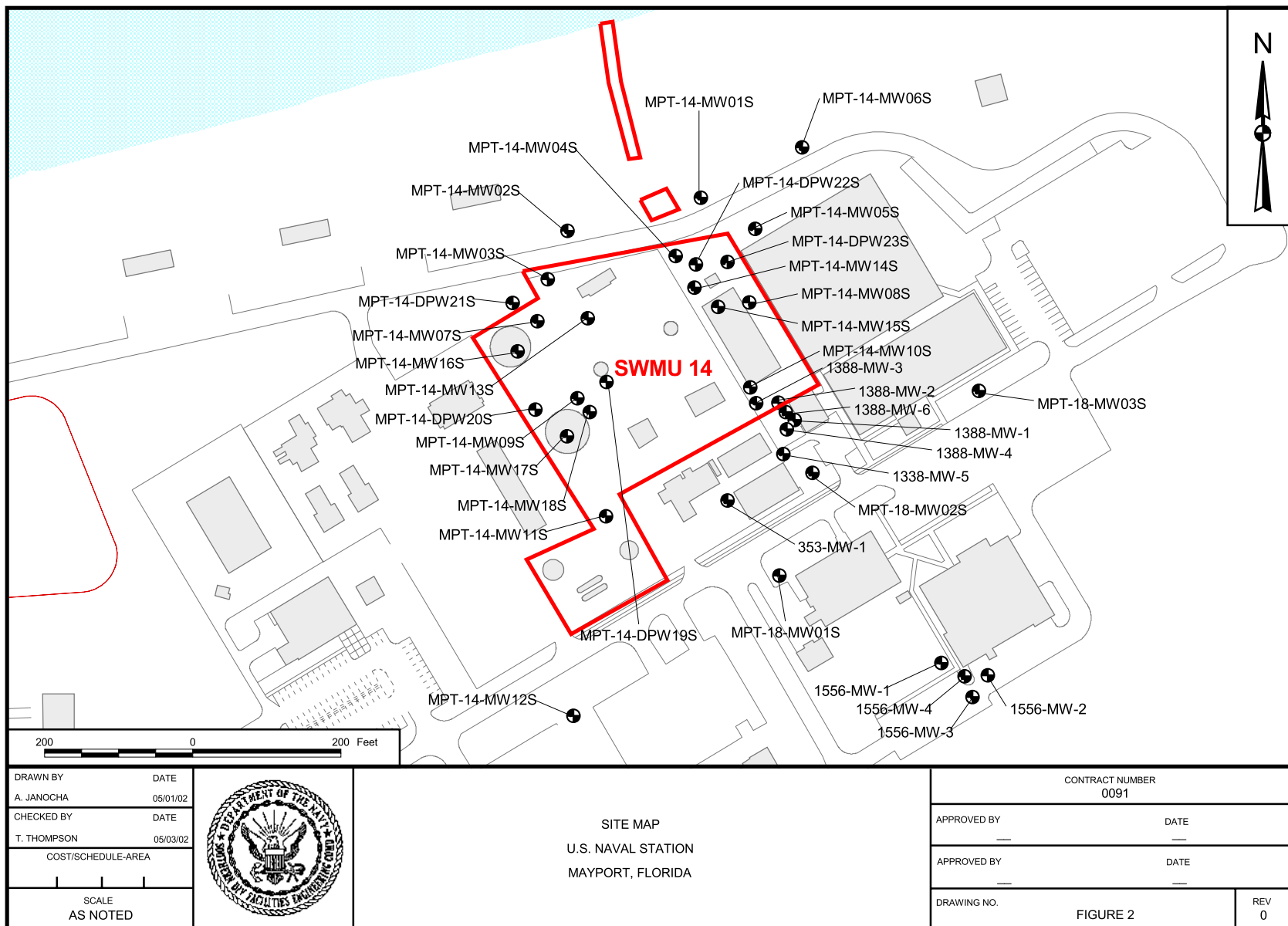
mg/L = Milligrams per liter.

SWCTL = Surface Water Cleanup Target Levels

## FIGURES



P:\GIS\MAYPORT\_NS\APRS\0123.APR SITE MAP LAYOUT 05/06/02 AJ



P:\GIS\MAYPORT\_NS\APRS\0123.APR SITE MAP LAYOUT 05/06/02 AJ